

# Mill Creek Flow Monitoring

A photograph of a shallow, clear creek flowing through a lush, green forest. The water is dark blue and reflects the surrounding trees. The banks are lined with large, smooth, grey rocks. In the background, a small wooden bridge is visible through the trees. The overall scene is peaceful and natural.

Summer 2008



No. 1 - Mill Ck at East River Road

Activated in mid-April

No. 2 - Allen\_Sexton Ditch (existing 4ft MT fl)

No. 3 - Mill Ck, 1st Bridge, Mill Ck Rd

No. 5 - Carters Ditch

No. 4 - Mill Ck, above Carters

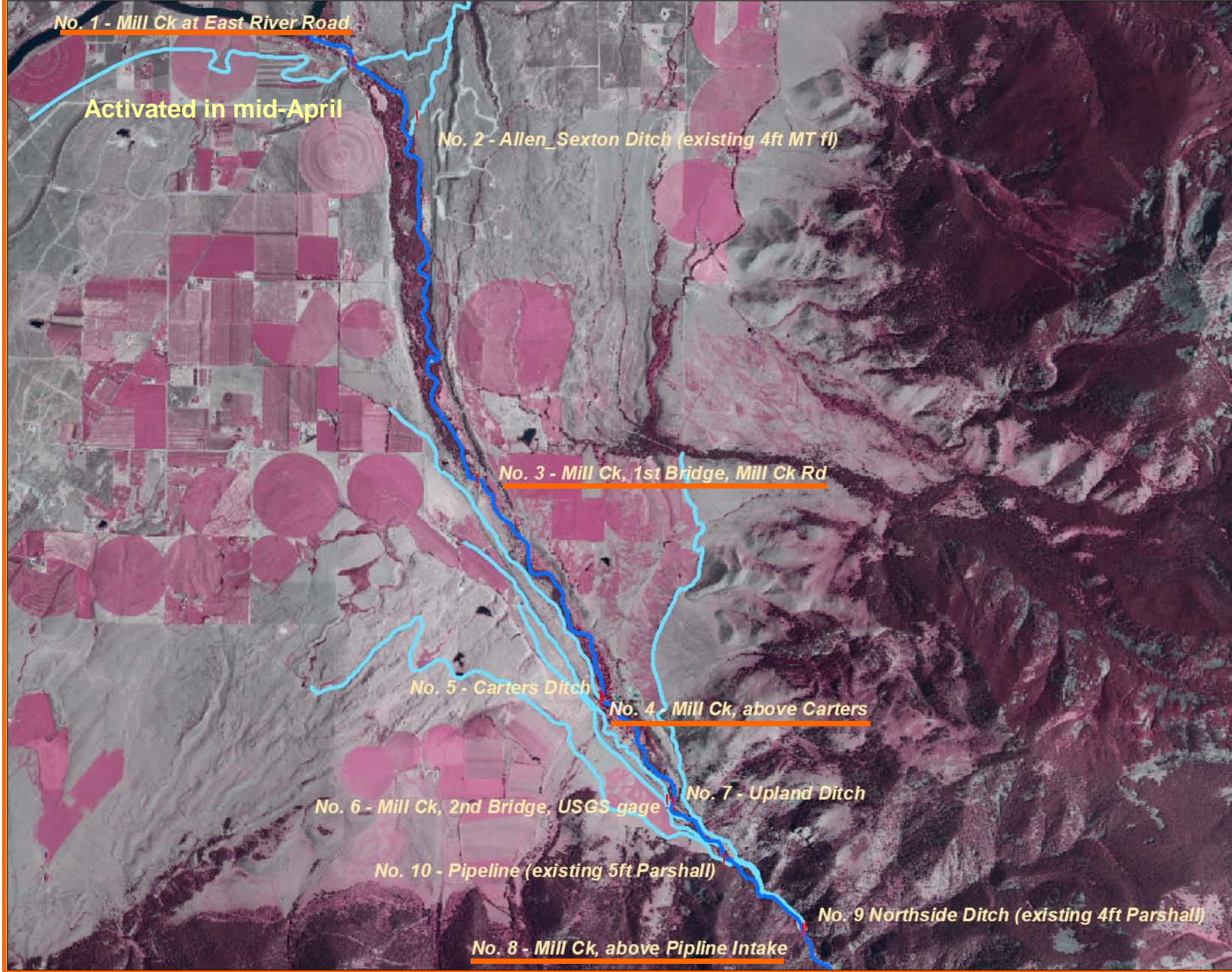
No. 6 - Mill Ck, 2nd Bridge, USGS gage

No. 7 - Upland Ditch

No. 10 - Pipeline (existing 5ft Parshall)

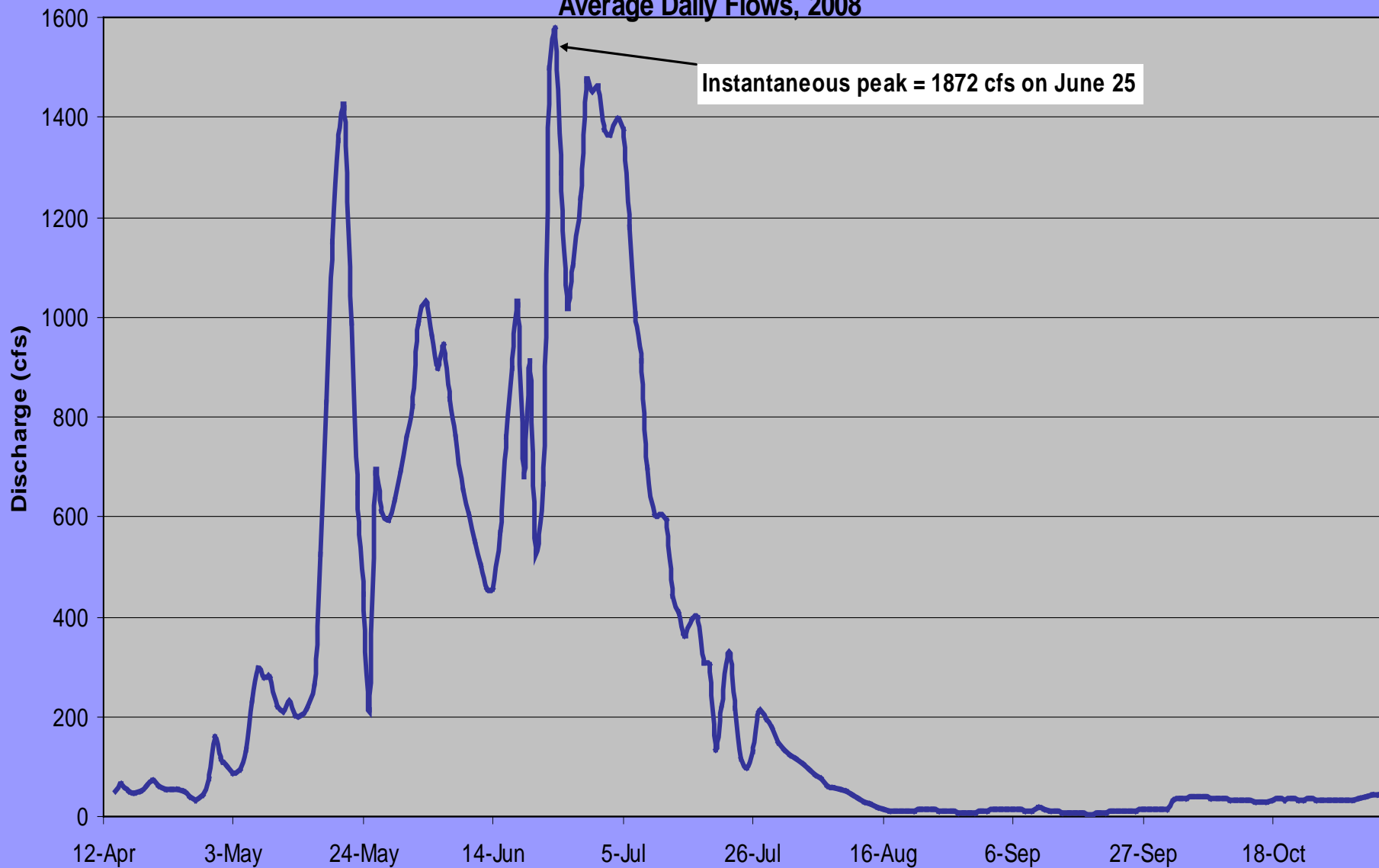
No. 9 Northside Ditch (existing 4ft Parshall)

No. 8 - Mill Ck, above Pipeline Intake

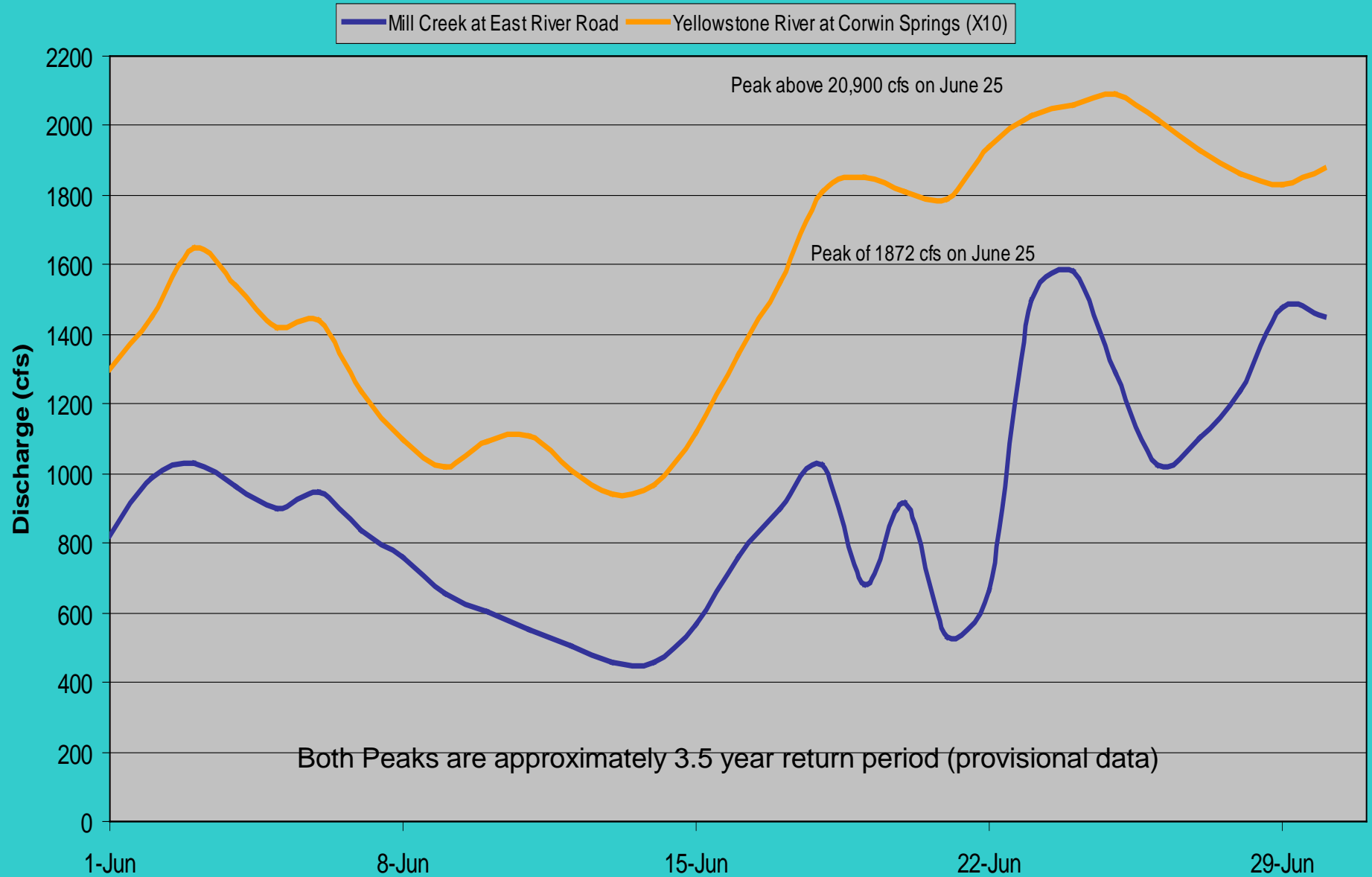


## Station 1: Mill Creek at East River Road

Average Daily Flows, 2008

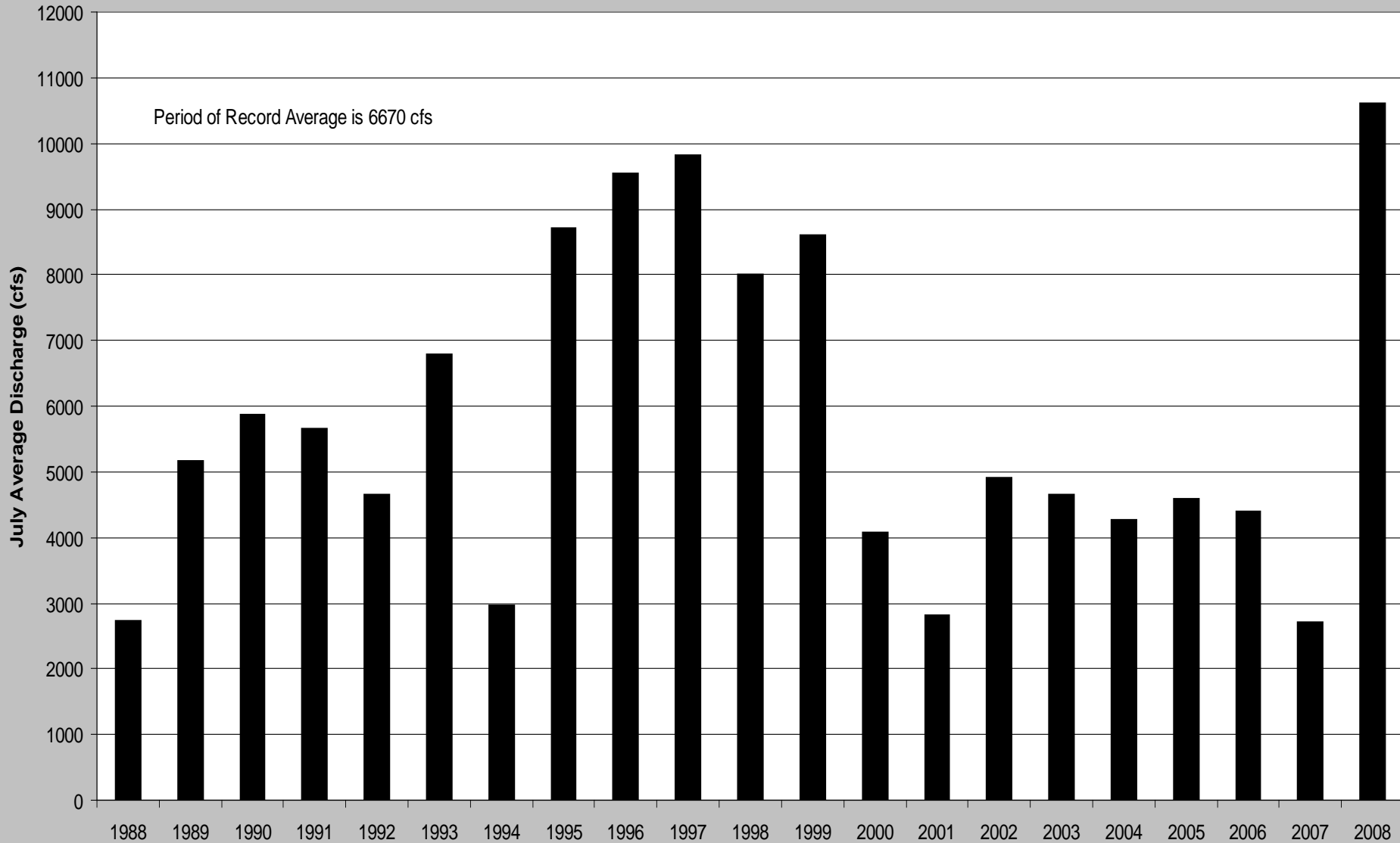


## Flow Comparison, June 2008



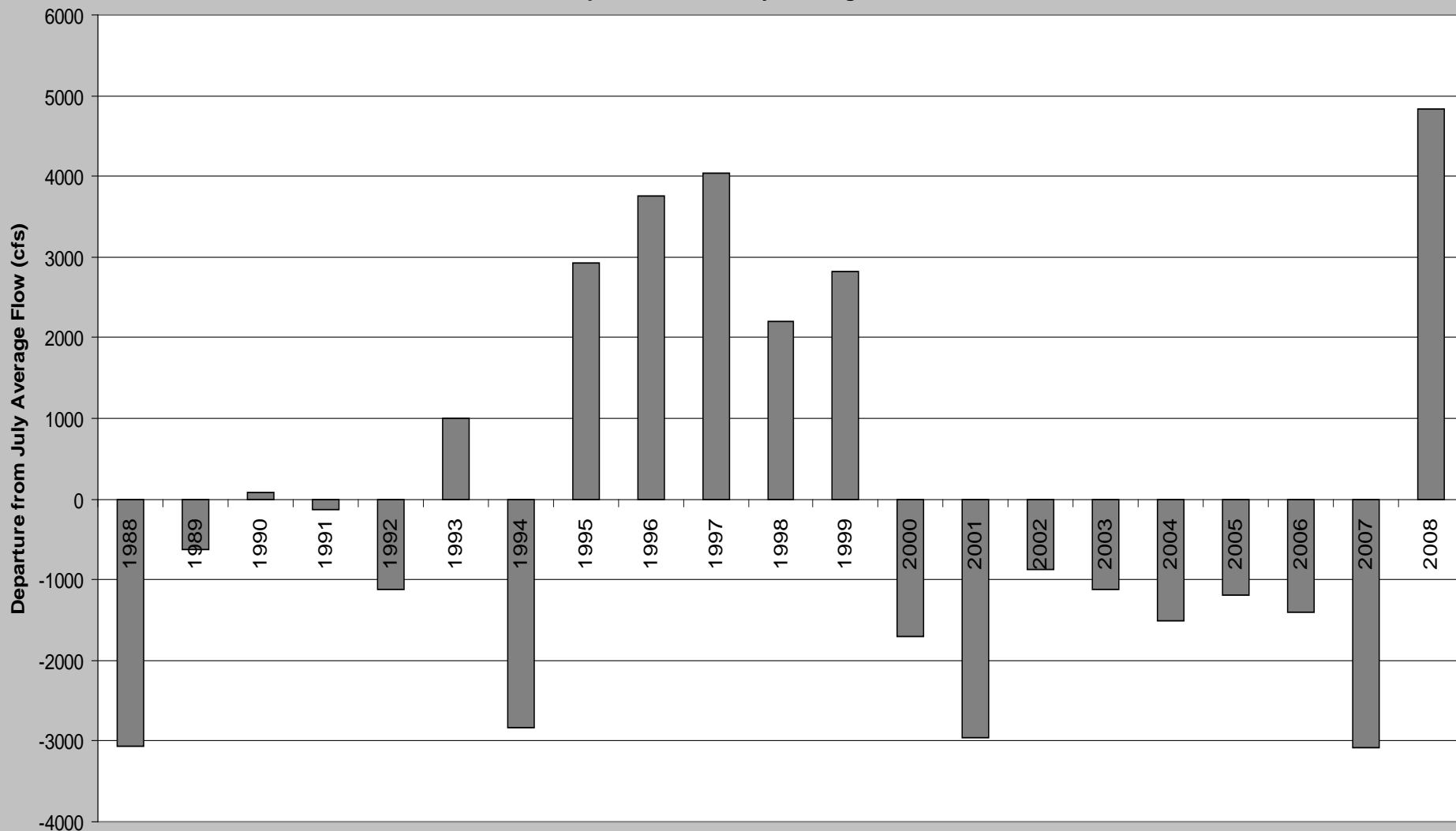
## Yellowstone River at Corwin Springs, July Average Flow

Period of Record Average is 6670 cfs



# Yellowstone River at Corwin Springs

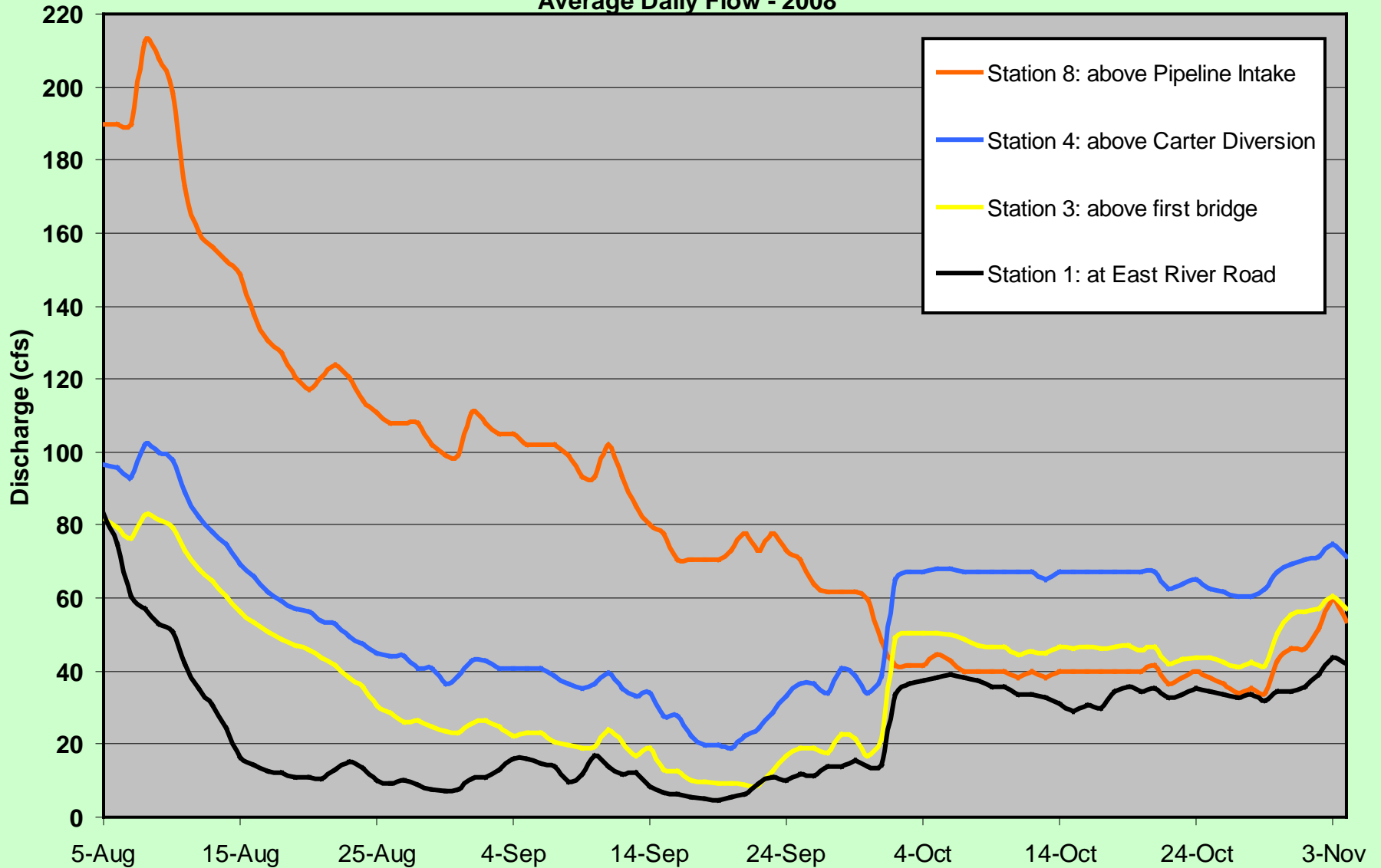
## Departure From July Average Flow





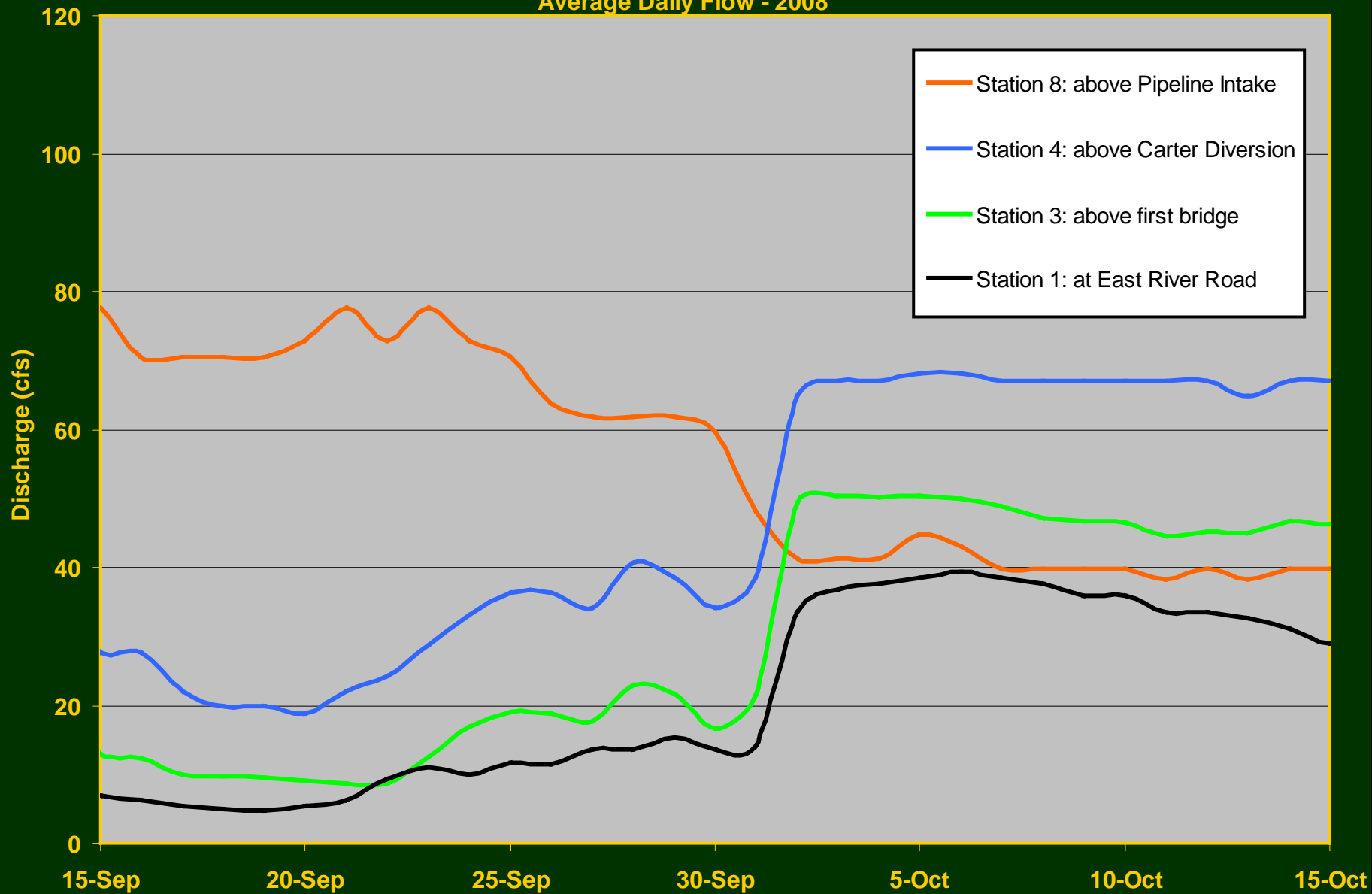
# Mill Creek Flow Comparison

Average Daily Flow - 2008



# Mill Creek Flow Comparison

Average Daily Flow - 2008





	Observed Flow (cfs)			Observed Flow (cfs)		
	5-Aug-08	cfs loss in reach	% loss in reach	10-Sep-08	cfs loss or gain, in reach	% loss or gain, in reach
<b>St8: above pipeline</b>	<b>189.0</b>			<b>84.6</b>		
9: Northside Ditch	39.0			24.2		
10: Pipeline flume	50.0			43.9		
7: Upland Ditch	1.0			0.3		
6. Bridge at Canyon Mouth						
<b>St4: Above Carter HG</b>	<b>96.8</b>	<b>-2.2</b>	<b>-1.2</b>	<b>22.7</b>	<b>6.4</b>	<b>7.6</b>
5: Carter Ditch	2.0			0.3		
Unidentified Ditches	3.0			3.0		
<b>St3: first Road Br.</b>	<b>85.0</b>	<b>-6.8</b>	<b>-7.0</b>	<b>15.9</b>	<b>-3.5</b>	<b>-15.6</b>
2: Allen-Sexton Ditch	3.0			0.0		
<b>St1: at E. River Road</b>	<b>73.0</b>	<b>-9.0</b>	<b>-10.6</b>	<b>10.0</b>	<b>-5.9</b>	<b>-37.3</b>
<b>Overall Loss or Gain</b>		cfs			cfs	
		-18.0			-3.0	
		percent			percent	
		-9.5			-3.6	

Positive numbers represent gains and gaining reaches.

Note that it was raining on Sept 10 when I took these Q's, which may account for gains in the uppermost reach.

(Higher elevations = more Precip).

Observed Flow (cfs)			Observed Flow (cfs)			Observed Flow (cfs)			
16-Sep-08	cfs loss	% loss	29-Sep-08	cfs loss	% loss	5-Nov-08	cfs loss	% loss	
	or gain, in	or gain, in		or gain, in	or gain, in		or gain, in	or gain, in	
	reach	reach		reach	reach		reach	reach	
69.2			55.6			44.7			St8: above pipeline
21.3			18.6			0.1			9: Northside Ditch
42.6			24.3			0.0			10: Pipeline flume
0.1			0.3			0.0			7: Upland Ditch
14.2	9.0	13.0	21.4	9.0	16.2				6. Bridge at Canyon Mouth
21.4	16.2	23.3	32.0	19.6	35.3	62.7	18.1	40.5	St4: Above Carter HG
0.1			2.0			3.0			5: Carter Ditch
2.0			1.0			0.0			Unidentified Ditches
13.0	-6.3	-29.4	22.8	-6.2	-19.4	58.1	-1.6	-2.6	St3: first Road Br.
0.0			0.0			0.0			2: Allen-Sexton Ditch
7.8	-5.2	-40.0	12.7	-10.1	-44.3	45.7	-12.4	-21.3	St1: at E. River Road
cfs	4.7		cfs	3.3		cfs	4.1		
percent	6.7		percent	5.9		percent	9.2		Overall Loss or Gain

No precip, clear and warm.

No precip, clear and warm.

Cold, with some rain & snow

# Possible sources of flow “gain”

- Surface contributions from unknown creeks or seeps
- Precipitation events
- Leaky ditches
- Subsurface contributions or delayed groundwater response
- Measurement Error





**Return from the Pipeline**



**Return from ponds/wetlands**



# In 2009:

- **Activate gauges earlier (July 1) depending on flow levels.**
- **Take more rating measurements at gauge sites.**
- **More measurements at the bridge at canyon mouth.**
- **Investigate source of “gain” between Station 8 and Station 4.**
- **Are there other diversions to measure?**
- **Relate precipitation/snowpack to flow characteristics.**





**Questions or Comments?**